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ABSTRACT

All published empirical studies of the Strong-Campbell Interest Inventory (SCII), 1974 thru 1980, are reviewed. While only a few predictive validity studies have been completed, concurrent and construct validity studies are consistently supportive of the validity of the General Occupational Themes, Basic Interest Scales and Occupational Scales. Several problems are noted regarding the appropriateness of the classification of Occupational Scales and Basic Interest scales within the General Occupational Theme groups. Too little work has been conducted with special scales and administrative indices to make assessment beyond those already noted in the inventory's manual. Studies of the presence of age, race, and sex bias in the instrument yielded data mostly supportive of the appropriateness of the SCII for the groups for which it is purportedly suitable. Areas in need of further or different types of research are identified. (Author/GK)

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Strong-Campbell Interest Inventory: Review of Empirical Research

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Abstract

All published empirical studies of the Strong Campbell Interest Inventory, 1974 thru 1980, are reviewed. While only a few predictive validity studies have been completed, concurrent and construct validity studies are consistently supportive of the validity of the General Occupational Themes, Basic Interest Scales and Occupational Scales. Several problems are noted regarding the appropriateness of the classification of Occupational Scales and Basic Interest Scales within the General Occupational Theme groups. Too little work has been conducted with special scales and administrative indicies to make assessment beyond those already noted in the inventory's manual. Studies of the presence of age, race, and sex bias in the instrument yielded data mostly supportive of the appropriateness of the SCII for the groups for which it is purportedly suitable. Areas in need of further or different types of research are identified.

Strong-Campbell Interest Inventory: Review of Empirical Research

The Strong-Campbell Interest Inventory (SCII) was published in 1974. The inventory itself has been reviewed by Campbell, Crichton, Hansen, and Weber (1974); Johnson (1976); Crites (1978); Dolliver (978); and Lunneborg (1978). The latter four reviewers all raised significant issues questioning the inventory's psychometric adequacy for both researchers and counselors. However, few data could be cited conclusively because of the recency of the inventory's publication . The purpose of this review is to examine published empirical literature employing the SCII, thereby permitting a more extensive data based assessment of the SCII's usefulness for counselors and clients and for investigators studying interests or their role in vocational behavior. Only data based articles are reviewed; reference is made to major published issue and discussion papers.

Initial Criticism of the SCII

The SCII has two major differences from its predecessors, the male and female forms of the Strong Vocational Interest Blank (SVIB): (1) inclusion of Holland's theoretical framework to provide scores in General Occupational Themes and (2) combining into one test booklet the male and female items, while maintaining separate sex scales (Campbell, 1974). The test items themselves remained quite similar to the SVIB ; only two new items were added. However, all items were reviewed, and revised as necessary, to remove references to gender (e.g. policeman changed to police officer).

The maintenance of separate sex scales and the resultant problems of interpretation has received the most voluble criticism in published reviews and comments (see all test reviews previously cited plus Steinhauer, 1976).

Several reviewers (Johnson, 1976; Steinhauer, 1976; Dolliver, 1978) also lamented Campbell's decision not to publish a listing of items

contained in each scale. While this policy is justified by Campbell (1976)as (1) precluding test piracy and (2) providing funds, through the machine scoring that is therefore necessary, there remains the problem that counselors cannot check profiles for accuracy nor explore with clients how their particular responses produced their scores. Moreover, researchers such as Utz and Korben (1976) could not explore, as fully as they desired, the construct validity of the occupational themes since the specific item content of each theme was not available to them.

Crites (1978) noted several interpretive problems due to (1) the pronounced effects of response styles (acquiescence, indifference) on SCII results, (2) inconsistencies frequently obtained between Basic Interest Scales and Occupational Scales of apparent similarity (e.g. art and artist), and (3) the tendency for persons to score higher on their opposite sex Occupational Scale, than on their own sex scale if that interest is usually preferred by their own sex. Several empirical studies, reviewed below, have been stimulated by each of these criticisms.

Psychometric Characteristics

Only a very few empirical studies have specifically addressed the reliability and validity of the SCII. However, many of the studies employing the SCII, for a variety of counseling and research interests, yield data that allow assessment of at least the concurrent validity of the SCII. Since the majority of studies containing validity data focus on only one type of scales within the SCII, that is, General Occupational Themes, Basic Interest Scales, or Occupational Scales, the data are reviewed separately for each of these types of scales, following a review of reliability studies of the entire

inventory.

Reliability. Both Blake and Fabry (1979) and Whitton (1975) have investigated the SCII's test-retest reliability since the publication of Campbell's first edition (1974) of the SCII manual. Whitton's two-week test-retest results with 180 high school seniors and college students were, in all cases, within .05 correlation points of Campbell's 14 and 30 day test-retest sample. All correlations were between .68 and .94 for the General Occupational Themes, Basic Interest and Occupational Scales, with means of .905, .895, and .895 respectively. Whitton checked test-retest reliability on cross-sex occupational scales as well as same sex scales and found each to have very similar ranges and means as the total set of Occupational Scales. Blake and Fabry (1979) had 208 high school seniors take the SCII twice in a three month interval. Over this longer interval, as might be expected, reliabilities were slightly lower, .82 for the General Occupational Themes .81 for Basic Interest Scales and .80 for the Occupational Scales. These data indicate at least minimally acceptable ranges of reliability for short test-retest periods, thereby assuring at least short-term consistency for clients or research subjects. The stability of responses over longer periods of time, for example, one year or more, has yet to be investigated.

The reliability and accuracy of the scoring of the SCII was investigated by Hansen (1977). It was noted that the scoring services for the SCII have improved over the SVIB's with regards to accuracy. The most frequent errors were for one and two-point differences which rarely alter the interpretation of scores. Three of the four scoring services had no error greater than three-points. On an average, seven percent of the few discrepant scores found could

cause an interpretive change. In general, it appears that the scoring agencies do a relatively adequate job of scoring the SCII; however, the reader must note that scoring systems are not error free.

Validity of General Occupational Themes. Of all the empirical studies employing the SCII and yielding validity data, the greatest number focuses on the General Occupational Themes (GOTs). Creaser (1976) investigated the homogeneity of the Occupational Scales within the GOTs. Average intercorrelations ranged from .49 for the occupations in the Realistic theme to .73 for the occupations in the Conventional theme. He identified several specific Occupational Scales, for example, registered nurse and veterinarian which, if reclassified, would lead to greatly enhanced homogeneity of the themes. Even so, he concluded that the correlations within GOTs seemed high enough to support counselors suggesting to a client that Occupational Scales within the same family of his or her high theme score were reasonable alternatives to consider.

Utz and Korben specifically addressed the construct validity of GOTs by having 403 counseling center clients complete both the SCII and the Edwards Personal Preference Schedule (EPPS: 1957). The EPPS needs were treated as predictor variables. All of the logically deduced relationships were in the predicted direction with approximately 50% reaching significance. It was concluded that "the occupational themes and related descriptors were validated in terms of similar personality variables." (p. 31) In an assessment of the GOTs psychometric validity, Rounds, Davison and Davis (1979) examined the fit between the SCII GOTs and Holland's (1973) hexagonal model. Using nonmetric scaling analysis, they found the fit was good for males but poor for females; in fact,

their data for females yielded a near reversal of the scaled positions of the Social and Enterprising scales.

Three other studies lend additional construct validity data. Robbins, Thomas, Harvey, and Kandefer (1978) studied the redirection of 62 men from the managerial professional level who changed occupations. Using three letter codes obtained from the Strong-Campbell Interest Inventory, they found that 26 men changed to careers more congruent with their personality, 25 to careers less congruent and 11 showed no change in degree of congruency from their job change. More supportive data was provided by Spokane, Malett, and Vance (1978) who demonstrated that subjects whose career choices were congruent with their SCII GOTs were more stable, more differentiated and more academically oriented than incongruent subjects. Relatedly, Reuterfors, Schneider, and Overton (1979) found, with 816 entering freshmen at North Texas State, that those with college major choices congruent with their SCII GOTs had greater academic success than those with incongruent choices.

Three authors have provided concurrent validity data of the SCII GOTs with other vocational interest measures. Lunneborg (1977) compared the results of 300 students' SCII GOTS with the Vocational Interest Inventory (VII: Lunneborg, 1976), a measure based on Roe's (1956) 8 groups of occupations. She concluded that her data strongly supported the validity of the GOTs. As examples, she obtained expected high correlations between the SCII realistic and the VII technical and outdoor, between SCII investigative and VII science, and between SCII artistic and VII general cultural. Slaney (1978) made extensive comparisons between the SCII GOTs and a Vocational Card Sort (VCS) measures of interests, a measure, as he used it, which elicited clients own

designation of how they would score on the Holland themes. 39% of his sample had identical high point codes on the two measures; Spearman rhos on the two sets of Holland themes yielded a mean of .51. Using both measures as predictors of students' expressed choices, he found that the VCS themes were better predictors of the expressed choices than the SCII themes, a finding subsequently replicated in Atanasoff and Slaney (1980). The latter study also showed that the Holland themes measured by the Self-Directed Search (Holland, 1972) were more closely related to expressed choices than were the SCII GOTs.

Concurrent validity data of the GOTs with current academic or career choice are provided by four studies. Catron and Zultowski (1977) were able to demonstrate significant theme differences among four academic divisions for 160 Wake Forest University seniors. As predicted, social science students were highest on the Social theme, humanity students on the Artistic theme, natural science students on the Investigative theme and business students on the Enterprising theme. Spokane (1979), using high score themes from the SCII GOTs of 618 University of Rochester seniors, found 34.4% of the females and 43.6% of the males reported occupational preferences congruent with their first letter code. Doty and Betz (1979) found that 45 males and 43 female sales managers obtained their highest scores on the Enterprising theme. Correlations of the Enterprising theme scores with job satisfaction attained significance, but only for the male sample. For the women, the correlation between job satisfaction was highest with Social theme scores. Whitton (1975) achieved good hit rates from the GOTs in predicting preferred occupation of 180 college students for 52% of the females and 53% of the males. Interestingly, using

other sex scores yielded nearly identical hit rates, 51% and 55% respectively.

Hansen (1977) has provided other data of interest regarding the validity of the GOTs. She coded each SCII item, using the statistical method of contrast groups, according to Holland's vocational theory. Her data indicated that there is considerable variation between the male and female items with regard to number of items in each theme. For example, only 1 female item is classified as Realistic whereas 14 male items have such a classification. 35% of the items could be assigned one Holland theme, 41% had to be assigned two themes, 16% required three themes, and 2% four themes. Hansen expressed the hope that these data could be used in subsequent revisions of the SCII to expand the pool of items where too few items seemed available for reliable measurement of the themes and for deletion of items which provided poor differentiation.

In summary, almost all of the studies achieved statistical significance in support of the concurrent or construct validity of the General Occupational Theme,especially for males. However, the GOT relationships with other instruments measuring similar concepts clearly indicates that the interest inventories utilized are not entirely interchangeable. Similarly, the accuracy of SCII classification of subjects' actual career choices and occupational choices, while statistically significant, yields almost as many errors as accurate hits. As Crites (1978) notes, these data are perhaps not to surprising in that similar data were prevalent for the SVIB. Concisely, while the inventory provides levels of accurate classification well beyond chance levels, there are still numerous inaccurate classifications in any large group of subjects.

Validity of Basic Interest Scales. Only four studies have examined the validity of the Basic Interest Scales (BIS). The studies cited above by Slaney (1978) and Lunneborg (1977) examined also the concurrent relationships of the SCII BIS with the Vocational Card Sort and Vocational Interview Inventory respectively. In Lunneborg's study, in 8 of 23 instances she failed to obtain the predicted relationships between the Roe categories and the BIS. However, she stated that "aside from the lack of relationship between Athletics and Arts and Entertainment, the most serious discrepancies have to do with misjudging the (SCII) Manual descriptions of three E Interests and characterizing them as ORG or CUL rather than BUS" (p. 190). She also examined the concordance of BIS to the General Occupational Themes to which they were assigned. Her data replicated relationships shown in the SCII manual, that, at least for one sex, basic interests like military activities, domestic arts, law/politics and public speaking may correlate more highly with a General Occupational Theme other than that to which it is assigned in the SCII. Therefore, at least for these BIS, it is not unlikely that persons might obtain inconsistency between their GOT scores and their BIS scores, an interpretive problem noted by Crites (1978).

Slaney (1978) assessed the degree of association between BIS and the Vocational Card Sort. Tau b values ranged from a low of .13 for the adventure scale to a high of .62 for medical service and law/politics.

Meuser and Edwards (1977) predicted arts and science membership among college freshmen from the BIS. They obtained a 90.6% accuracy for science males, 79% for arts females, 50% accuracy for science females and 43% arts males.

Whitton (1975) is the only researcher to report concurrent validities between the Basic Interest Scales and a preferred occupation. She obtained 51% good hits for females and 55% for males using appropriate sex norms; using opposite sex norms reduced the good hit rate to 41% and 43%, respectively.

It should be noted that there has been no empirical examination, other than those reported in the manual, of the relationships of the BIS with the Occupational Scales. Campbell (1977) does now provide a table indicating which occupation should correlate high or low with each BIS. Such studies are needed not only to add to the validity of each type of scale but also to provide better data for counselors as to what occupations are most pertinent to be considered when a high Basic Interest Scale score is obtained. At this point, the evidence suggests that users would make errors of both omission and commission if high BIS scores are considered only in terms of their GOT assignment.

Equally important to note is the lack of any empirical studies of the predictive or even concurrent validity of the Basic Interest Scales for presently employed persons.

Validity of the Occupational Scales. Two studies address the construct validity of the Occupational Scales using other classifications of interests based on Roe's (1956) model of occupational classification. Lunneborg (1977) and Lunneborg and Lunneborg (1978) extended their examination of the relationship of the Vocational Interest Inventory to the SCII Occupational Scales. In the 1978 study, in predicting SCII Occupational Scales from their Vocational Interest Inventory factor scores, based on Roe's (1956) system, the home economics teacher and chirophractor scales were the most poorly predicted though 14 other

occupational scales had correlationsof less than .40 with the predicted VII factors. In the 1977 study, Lunneborg examined whether the Occupational Scaleshad been assigned to appropriate General Occupational Themes, again assessing appropriateness in terms of the VII factors. She concluded that her data raised questions about the classification of five occupational scales: dietitian (male scale), speech pathologist (female and female scales) physical education teacher (female scale and home economics teacher (female scale).

Slaney's (1978) comparison of the Vocational Card Sort ratings with the SCII Occupational Scales yielded tau b values of .03 to .62 with the values for only 8 of 57 scales failing to reach significance: Army officer, life insurance agent, dental hygienists, college professor, speech pathologist, psychologist, language interpreter and librarian. At best, one must conclude that the limited though positive relationships between the two sets of scales "leaves enough variance unaccounted for to render the estimation of the responses of one instrument from the other highly questionable." (p. 527).

Only one clear predictive validity study of the Occupational Scales has been conducted. Spokane (1979), using the McArthur method, found excellent prediction of senior major choices evidenced for 42.5% of the females and 59.3% of the males for students who were assessed initially as freshmen. Many other investigationshave assessed concurrent validity of the SCII with current preferred or actual choice. Whitton (1975), studying college students, compared the percentages of good hits, when predicting preferred occupation, using same-sex, cross-sex, and all (both sex) scales. "The most impressive result is a large gain of percentage good hits which results from consideration of all occupational scales rather than just the same sex scales. The increases, from 44% to 59% for women, from 42% to 56% for men, and from 43% to 58% for the total sample were significant at the level $p < .001$" (p. 208).

Johnson, Kirk, Ohvall, and Barbre (1978) investigated the validity of the male and female pharmacy scale for male and female pharmacy students. While both scales significantly differentiated the pharmacy students from college students in general, the female pharmacist scale was found to be more effective in such discrimination. Both sexes scored somewhat higher on the female pharmacy scale than they did on the male scale. In a later study, Johnson (1978) showed that a "unisex" scale, retaining only the 20 items where males differed from females by less than 10 percentage points, yielded less long term reliability but equally good validity as the full SCII scales for discriminating pharmacy students from students-in-general.

The most extensive validity study of the Occupational Scales is reported by Worthington and Oliver (1977). They had 89 persons who completed the SVIB in 1969 also complete the SCII in 1975 and appropriate current job status questions. They concluded that the SCII has concurrent validities that surpass the SVIB, obtaining 58% good hits for the SCII and 41% good hits for the SVIB. The correlation between relevant SCII Occupational Scales and job satisfaction was .31.

The internal validity of assignment of Occupational Sacles to GOTs has been examined by both Lunneborg (1977) and Creaser (1976). Lunneborg found that 51% of the Occupational Skills correlated more highly with "incorrect" GOTs (that is, not assigned to that theme). Creaser, in reviewing his results, recommended that the social scientist scale be moved to the Social theme, the physical therapist scale to the Realistic or Investigative theme and that the investment fund manager and agriculture business manager scales be removed from the Enterprising scale. These data, combined with Creaser's (1976) homogenaity data reviewed in the section on validity of the GOTs, again suggest considerable caution

since the GOT classification of many of the Occupational Scales could mislead examinees regarding related occupations.

Unfortunately, at this point the data on the Occupational Scales are primarily concurrent. While the data suggest that the SCII Occupational Scales are probably as adequate, if not superior to those of the preceeding SVIB, the empirical data on the predictive validity of the Occupational Scales, beyond those reported in the test manual, are yet to be obtained. In the meantime, the number of differences in interest classifications obtained by other measures and self-report systems, when compared to the SCII Occupational Scales, suggests that testers use considerable caution in treating any one SCII occupational scale as the indicator of specific career interests or as the best indicator of logically expected alternatives. As with the GOTs and BISs, while statistical significance beyond chance is readily demonstrable, many "misses" occur if one considers either predictive validity or concurrent validity. Where a very high degree of assurance of accuracy of interest measurement is desired, the administration of two or more interest inventories would seem advisable. Congruence of results would enhance certainty; incongruence would suggest the possible range that might best be considered.

Validity of Special Scales and Administrative Indices. There has been only one study reporting data on the Academic Orientation and Introversion-Extraversion scales. As part of his broader study of the development of interests, Grotevant (1976), studying mothers, fathers, sons and daughters in 52 families, found that both males and females who score higher on the Academic Orientation scale have higher educational levels (r =52 for fathers, .34 for mothers). Unexpectedly, less introverted males and females also obtained higher AOR scales.

·(r = -.24 for fathers, - .52 for mothers). Correlations of introversion-extraversion, measured by the SCII, with Eysenck's personality inventory (1968) ranged from -.24 for fathers to -.57 for daughters (negative correlations are expected since Eysenck's scale is an extraversion scale). Obviously, there has been all too little research on these scales to make definitive statements about their validity and further studies must be conducted if continued use of these scales is to be warranted.

Effects of Interpretive Techniques

Rubinstein (1978) and Miller and Cocrane (1978, 1979) have investigated the effects of different methods of interpreting the results of the SCII. Rubinstein compared the effects of traditional individual interpretation using test profiles with an integrative individual interpretation where the test profile is not presented. Instead, information from the test is entered in the interview whenever relevant topics are being discussed. He found that the effects for clients interacted with the particular counselors using them, some achieving more satisfactory results with each method. In comparing the effects of traditional and integrative and group approaches, he found that the more economical group approach was as effective as the other individual approaches for developing client self-knowledge of interest patterns and vocational certainty.

Miller and Cochran, in two studies (1978, 1979) compared four methods of reporting SCII results: counselor, audiovisual, combination, and control. Accuracy of recall information and student satisfaction ratings revealed no significant differences among the three experimental groups. Students in the counselor only group did rate coverage of testing information as being significantly better than did those students in the audiovisual group. All groups receiving results did better on the criterion variables than did the control group. These results, like those with a variety

of career intervention instruments (Fretz, in press), suggest there may be a variety of more economical procedures of test interpretations that are as equally effective as individual counselor interpretations.

Stimulus Value of SCII

O'Neil, Price and Tracey (1979) and Cooper (1976) compared the impact of the SCII with the Self-Directed Search (Holland, 1972) and a Vocational Card Sort, respectively. Cooper found that a vocational card sort was more effective than the SCII for broadening career options and for increasing frequency of subjects' reading of occupational information. O'Neil, Price and Tracey (1979) administered 96 college freshman both the SDS and the SCII. The students perceived the SCII as having greater clarity of directions than the SDS, but rated the SDS as stimulating more thinking about their career planning. No significant differences were obtained between the groups on certainty about career planning.

These results suggest that the SCII may be less effective than other interest assessment devices in its ability to stimulate career exploration.

Response Style

Despite the criticism made by Crites (1978) that response style could greatly affect the shape of the profile, the only empirical investigations regarding response styles have investigated a hypothesized relationship between self esteem and response style on the SCII (Friedel, Hansen, Hummel, and Shaffer, 1979; Ohlde, 1979). Ohlde (1979) found that both male and female subjects with high and middle levels of self esteem, compared to those with low self esteem, responded more often with like preferences on all sections of the SCII. Friedel, Hansen, Hummel, and Shaffer (1979) focused their

investigation on the "your characteristics" section of the SCII. The correlation of like preferences in this section and self esteem was +.21 or +.15 for 198 college students, depending on which method was used to score self esteem. The authors note that the correlation, while significant, is of course quite modest and urge caution in the clinical use of the SCII like - dislike distribution as an indicator of individuals' level of self esteem. They also urged that an investigation like theirs should be conducted with adult samples since students generally have a lower like response rate than do other occupational samples.

Age and Race Bias

Despite the frequency of expressed concerns regarding use of standardized instruments with ethnic and racial minorities, thus far there have been no published studies examining racial differences in the SCII. While Campbell (1977) feels that the results of Borgen and Harper's (1973) finding of the adequacy of the SVIB for Blacks argues that special research is not needed for race bias in the SCII, given the changes that have been made between the two instruments, the question yet remains to be answered empirically.

Hansen (1978) investigated whether age would systematically affect SCII results. Subjects were selected from six occupations: female advertising executives, physicists, and social workers; male social workers, speech psychologists and registered nurses. Three age groups were established: 26 to 35, 36 to 45, 46 to 55. Subjects were equated for education and experience within age group. Among many statistical comparisions, few were significant. Hansen concluded: "These data indicated that relevant occupational interests generally are not significantly different for people in the

same occupation who are in their 30s, 40s, or 50s. Their perceptions of the occupational world as reflected by the General Occupational Themes are similar, and for most occupations the corresponding SCII Occupational Scale does not discriminate among age groups." (p.86). Thus, the study provides evidence, in these reasonably broad samples, that age is not a significant factor affecting results of the SCII.

Sex Bias

Even before the 1974 publication of the SCII, there was an increasing amount of empirical literature devoted to the question of how best to utilize the male and female forms of the SVIB (e.g. Johanson and Harmon, 1972; Munley, Fretz and Mills, 1973). The matter of sex bias in the SCII has been investigated in a number of different ways. For anyone pursuing this topic, one critical reading should be Hansen's (1976) "Exploring new directions for the Strong-Campbell Interest Inventory Occupational Scale Construction." Hansen used six different methods of scale construction to examine the feasibility of combined sex scales for male and female sociologists. Her article distinctly identifies the advantages and disadvantages of separate versus combined scales. It clearly indicates that the issue is not one of right or wrong, but rather of what "costs" one wishes to pay in terms of the full range of psychometric qualities ranging from reliability thru face validity to predicted validity.

Three authors have focused specifically on those occupations where there are presently scales for both sexes. Johnson (1977) examined relationships between the 37 pairs of same named occupational scales for 1134 male college freshman and 1044 female college freshman. His conclusion was that the two

sets of scales should not be considered equivalent, median correlations ranging from .75 to .79. While the correlations were quite high, he was concerned with the fact that most mean differences on the matched scales were greater than five standard score points. Creaser and Carsello (1976) made a similar investigation with 525 male and female entering college students. Their data yielded correlations ranging from .42 to .94. Mean differences ranged from 5 to 13 standard score points between male and female scales for the same occupation. Both of these studies found that subjects scored higher on cross-sex scales for occupations traditional for their sex, continuing the problem noted by initial test reviewers of having to explain to subjects why their scores are higher for the cross sex scale than for their own sex scale. Providing the appropriate statistical explanation for this phenomena to a client, who is probably more concerned with his or her own sex role adequacy when they see such data, is hardly comforting!

Campbell (1976) focused her research on male and female law students. While her analysis revealed some systematic differences in responses between the sexes, she concluded that "the variance between sexes for law students seems to operate in a systematic harmless way for the other sex" (p. 134). She further suggests that the disparity between the two sexes' scores on each sex's scales often reflects differences between male and female general samples rather than differences between male and female lawyers. Given the interpretive problems already noted in having different sex scores for a given occupation, plus the possibility that maintaining separate scales generates a self-fullfilling prophecy that there are sex differences, Campbell concludes that a single scale for each occupation is feasible and desirable.

Harmon and Conroe (1976) took a somewhat different approach to sex bias and examined sex stereotyping in the occupational type and the activity sections of the SCII. Their study with 87 college women and men taking the SCII under standard instructions versus responding as "typically feminine women" and "typically masculine men," respectively, showed that activity items were less amenable to sex stereotyping than occupational titles. Response patterns changed most in the two sets of testing instructions for occupational items and school subject items. They noted,however, that these items are presented in somewhat different form than other items on the SCII; therefore, they could not tell from their data whether it was the form of the items or the content of the items which was most influential in making them subject to change under stereotypic sets for taking the test.

O'Neil, Price, and Tracey (1979) investigated whether or not there were sex differences in immediate reactions to the treatment effects of interpreting the SCII and the SDS. They found no sex differences in either immediate reactions or reactions one month later concerning satisfaction with career planning and time spent thinking about the career planning process.

The final study of related interest to the sex bias area is that of Lunneborg and Gerry (1977) who compared college students' SCII responses to the women-in-general and men-in-general samples to determine whether college age persons were showing any reduction in sex stereotyping in occupational choices on the various scales of this Strong Campbell Inventory. Contrary to their predictions, they found that the college females differed little from the women-in-general sample, but that the college males differed from men-in-general in showing significantly more interest in the Artistic areas of work

and significantly less interest than men-in-general in the Realistic and the Enterprising areas. None of these articles significantly refute any of Campbell's (1977) prior positions, nor do they conclusively demonstrate that there are more problem free alternative methodologies for interest assessment of both sexes.

Development of Interests

Grotevant (1976) and Grotevant, Scarr, and Weinberg (1977) have examined the relationships of parent and child interests as measured by the SCII. Grotevant's first study yielded consistent modest positive correlations between the General Occupational Theme scores and the Extraversion and Academic Orientation scores of parents and children. In general, father-son, mother-daughter correlations exceeded father-daughter, mother-son correlations with medians of .22 .25 and .12 and .19, respectively, for the General Occupational Themes. In the Grotevant Scarr and Weinberg study, 114 biologically related families and 109 adoptive families were studied. Biological parent-child correlations ranged from -13 to .40 with 14 of 24 scale correlations achieving significance whereas only two of the adoptive parent-child correelations reached significance with a range of -.15 to +.25.

Studies such as these are but a meager beginning of some of the heuristic research that should be stimulated by the SCII on the full range of organismic and environmental variables that contribute to the development of interests.

Conculsions

This review of the empirical studies employing the SCII permits three positive assessments of the SCII. First, none of the studies has significantly contradicted the manuals (1974, 1977) in terms of the psychometric qualities of the instrument and its appropriateness for the populations for which it is

purportedly suitable. Second, statistical significance can be obtained for a variety of concurrent and construct validities of the General Occupational Themes, Basic Interest Scales and Occupational Scales. Third, among the few empirical comparisons of the SCII and other interest measures in terms of validity and utility, there is no compelling evidence that any other measure of interest provides a significantly superior result. These data suggest the SCII is a good choice amont interest inventories for both counseling and research purposes.

Equally apparent throughout the empirical data thus far collected are two clear limitations of the SCII. None of the studies remedy the initial criticisms by test reviewers, either by proving them wrong or by providing definitive strategies for coping with such problems as the effects of bias on patterns of interests and the inconsistencies of Basic Interest Scales and General Occupational Themes. Secondly, while evidence of concurrent and construct validity is statistically significant, the magnitude of correlations is not greatly impressive eventhough it may equal or surpass the validity of other interest measures. One would hope that, in subsequent revisions of the interest inventory, the authors would consider many of the suggestions of researchers to increase both internal and external validities. As already noted in section summaries, attention should be given to the classifications of BIS and OS within the various GOTs. Without improvements in these classifications, numerous idographic errors will continue to be made by counselors' using the SCII, eventhough it provides significantly better classifications than chance.

There is clearly an uneven amount and quality of research with regard to the various aspects of the Strong Campbell Interest Inventory. In these

early years, many of the studies have been the easy-to-do ones with college students, and/or simply comparing one instrument with another. Ideally, since the long term goal, at least for counseling purposes, is accurately assisting students and clients to choose appropriate careers in the world of work, more studies like Robbins, Thomas, Harvey and Kandefor's (1978) need to be conducted, where the careers and career patterns of workers are the primary criteria for evaluating the SCII's General Occupational Themes, Basic Interest Scales, Occupational Scales and Administrative Indices. The longer term studies of SVIB such as those conducted by Dolliver and Will (1977) can serve as a model for this kind of data collection with the SCII. Present researchers of college students are hopefully taking every step to insure the possibility that they can make longer term follow-up of their subjects in subsequent years when they have been actively engaged in careers.

Equally in need of the attention of researchers are more basic issues concerning 1) the structure of the SCII and 2) the concomitants of the development and change of interests as measured by the SCII. As reviewed in earlier sections, predictive accuracy, while significant beyond chance, is correct for only about one half of all cases. No studies have yet focused on what steps might be taken in analyzing or modifying the inventory to improve predictive validity. While no <u>one</u> study in this area could be definitive, a program of research in this direction must be established if there is to be any progress in improving predictive accuracy.

Relatedly, is the lack of empirical congruence of logically related BIS, OS, and GOTs a psychometric problem or a reflection of differential dimensions of interests? No research has pursued the issue beyond descriptions of differences.

Since the SCII manual promotes the use of the special scales and administrative indices, it is essential that additional validity studies be given a high priority in future SCII research.

Given the previous widespread use of the Strong Vocational Interest Blank in studies of development and change in interests, and the role of interests in a variety of vocational behaviors, it is disappointing that few researchers have begun similar research with the SCII. Campbell (1977) outlines many of the areas that have both basic and applied implications: e.g., role of interests in career patterns, interpersonal relationships, job design, institutional change. All of these areas hold attractive, untapped potential for understanding not only more about interests but also the contributions interests can make for understanding a broad variety of vocational behaviors.

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